a heater disposed adjacent to said high-emissivity layer to form a clearance therebetween, the clearance being 0.1 mm or more, wherein:

said internal electrode has an emissivity less than 0.3; and

said high-emissivity layer has an emissivity of 0.3 or more, and a porosity more than ~~a predetermined value.~~ 10 percent

~~22~~ 6. An oxygen concentration detector according to claim ~~21~~ 5, wherein said high-emissivity layer substantially consists of at least one material selected from a group consisting of alumina, titanium oxide, zirconium oxide, iron (III) oxide, nickel oxide, manganese oxide, copper oxide, cobalt oxide, chromium oxide, yttrium oxide, cordierite, silicon nitride, aluminum nitride, and silicon carbide.

~~23~~ 7. An oxygen concentration detector according to claim ~~21~~ 5, wherein said internal electrode is made of only noble metal.

~~24~~ 8. An oxygen concentration detector according to claim ~~21~~ 5, wherein said high-emissivity layer has a surface roughness of 1 μm or more.

~~25~~ 9. An oxygen concentration detector according to claim ~~21~~ 5, wherein said high-emissivity layer has a thickness of 5 μm or more.

~~26~~ 10. An oxygen concentration detector according to claim ~~25~~ 9, wherein the thickness of said high-emissivity layer is in a range of 10-20 μm.

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11 ~~27~~. 11 An oxygen concentration detector comprising:

a sensor element including a solid electrolyte and external and internal electrodes provided on external and internal surfaces thereof, respectively;

a heater disposed within said sensor element adjacent to said internal electrode; and

a high-emissivity layer provided on a surface of said heater to form a clearance between said high-emissivity layer and said internal electrode,

wherein said high-emissivity layer has an emissivity of 0.6 or more, and a porosity more than a predetermined value.

12 ~~28~~. 12 An oxygen concentration detector according to claim ~~27~~ 11, wherein said high-emissivity layer substantially consists of at least one material selected from a group consisting of iron (III) oxide, nickel oxide, manganese oxide, copper oxide, cobalt oxide, chromium oxide, silicon nitride, aluminum nitride, and silicon carbide.

13 ~~29~~. 13 An oxygen concentration detector according to claim ~~27~~ 11, wherein said internal electrode is made of only noble metal.

14 ~~30~~. 14 An oxygen concentration detector according to claim ~~27~~ 11, wherein said high-emissivity layer has a surface roughness of 1 μm or more.

31. An oxygen concentration detector comprising:

a sensor element including a solid electrolyte and external and internal electrodes provided on external and internal surfaces thereof, respectively;

a heater disposed inside said internal electrode;

a first high-emissivity layer provided on a surface of said heater; and

a second high-emissivity layer provided on a surface of said internal electrode, wherein:

said internal electrode has an emissivity less than 0.3;

each of said first high-emissivity layer and said second high-emissivity layer has an emissivity of 0.3 or more, and a porosity more than a predetermined value; and

said first high-emissivity layer is separated from said second high-emissivity layer to form a clearance therebetween, the clearance being 0.1 mm or more.

32. An oxygen concentration detector comprising:

a sensor element including a solid electrolyte and external and internal electrodes provided on external and internal surfaces thereof, respectively; and

a heater disposed adjacent to said internal electrode to form a clearance therebetween, the clearance being 0.1 mm or more;

wherein said heater substantially consists of at least one material selected from a group consisting of silicon nitride, aluminum nitride and silicon carbide.

33. An oxygen concentration detector according to claim 32, wherein said heater has a polygonal cross-section.

34. An oxygen concentration detector according to claim 32, wherein said heater consists of a material having an emissivity of 0.6 or more.

~~35~~. An oxygen concentration detector according to claim ~~32~~, wherein said internal electrode is made of only noble metal.

36. An oxygen concentration detector comprising:

a sensor element including a solid electrolyte and external and internal electrodes provided on external and internal surfaces thereof, respectively; and

a heater disposed adjacent to said internal electrode;

a high-emissivity layer provided on a surface of said internal electrode to form a clearance between said heater and said high-emissivity layer, the clearance being 0.1 mm or more,

wherein said high-emissivity layer has an emissivity higher than that of said external electrode.

~~37~~. An oxygen concentration detector according to claim ~~35~~, wherein each of said external and internal electrodes is made of only noble metal.--

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REMARKS

Claims 12-15 and 21-37 are now pending.